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PROJECT NO. 52373

**REVIEW OF WHOLESALE § BEFORE THE
ELECTRIC MARKET § PUBLIC UTILITY COMMISSION
DESIGN § OF TEXAS**

COMMENTS of

Texas Electric Transportation Resources Alliance (TxETRA)

TxETRA is pleased to submit answers to the questions in Project No. 52373, dated September 2, 2021. TxETRA is a non-profit organization comprised of utilities, electric vehicle manufacturers, charging companies and non-profit consumer and environmental organizations.

Executive Summary

Winter storm Uri, this year's early summer heat spell, and hurricanes are forcing more and more Texans to take power back up into their own hands and not rely on their utility. Consumers are exploring solar, battery backup and electric vehicles as resources they can use to power through the worsening coming storms.

New technologies and plummeting costs will make EVs and storage batteries affordable and widespread over the next decade. If 1000 13.5KWh Tesla power walls were discharged simultaneously, that could generate 13.5 MW of instantaneous power. 80% of the EV batteries that are removed from use in EVs are repackaged and reused as battery storage devices and those batteries are projected to last an additional 10 years.

Many commercial, industrial, and residential customers are turning to zero carbon or low carbon electricity sources and using EVs as a tool to lower their transportation costs while meeting their sustainability goals.

These new battery resources are extremely responsive and the energy can be fully deployed instantaneously by pushing a button. These resources respond far faster than starting a powerplant and can be aggregated into a virtual power plant. EVs and batteries are inverter based so they can be used to meet spinning reserve requirements.

EVs sales are growing rapidly. 575,543 EVs were registered in Texas as of August 5, 2021,¹ with 60 kWh batteries.² By 2030 that number could increase sixfold to 3,768,000 EVs in Texas, with 100 kWh batteries.³ Recent studies have shown that 50-75% of EV owners might participate in demand management programs.⁴ These capabilities will become routinely enabled as standards are finalized by the National Institute of Standards and Technology (NIST) in 2024 and so by 2030 they could be a large source of responsive distributed energy. Seven major manufacturers have recently announced their new EVs will offer V to X capabilities by 2025.

School bus fleets can be used to shave demand during summer and winter peaks but also can be used to provide energy for evacuation centers at schools or deployed as cooling or warming centers in weather related emergencies.

These resources are far more likely to be plugged in and available as a demand response tool or for grid dispatch if there is value to the consumer and aggregator. While the cost of EV battery capacity is borne by their owners, the added cost of the smart chargers needed for demand management or grid interconnection will need to be justified by a market price high enough to reward consumers for the added costs of interconnection.

Let's put some dollars and sense into the discussion to illustrate costs and necessary revenue streams. Today 85% of EV owners charge primarily at home on a Level 2 240 volt charger. These “dumb” chargers typically cost about \$600 installed. EV owners typically plug in when they get home with little thought to how the load might affect the grid, a pattern which can be altered by setting the onboard controls to discourage charging at peak. This pattern can be shifted by utilizing a time of use rate.

¹Dallas Fort Worth Clean Cities, Texas Electric Vehicle Registration Tool, <https://app.powerbi.com/view?r=eyJrIjoieYTRIY2M2MTctZDYwZC00MDNjLTlkZDMtZjY5N2Y1YzlkNzA5IiwidCI6IjJmNWU3ZWJLTlYyYjAtNGZiZS05MzRjLWFhYmRkYjRlMjliMSIsImMiOiN9.>

² Electric Vehicle Database, Useable Battery Capacity of Full Electric Vehicles, <https://ev-database.org/cheatsheet/useable-battery-capacity-electric-car.>

³ Federal Consortium for Advanced Batteries, National Blueprint for Lithium Batteries, 2021-2030, June 2021, pg. 15, https://www.energy.gov/sites/default/files/2021-06/FCAB%20National%20Blueprint%20Lithium%20Batteries%200621_0.pdf.

⁴ J. Bailey, J. Axsen, Anticipating PEV Buyers' Acceptance of Utility Controlled Charging, Transportation Research Part A: Policy and Practice, Volume 82, 2015, pp. 29-46, ISSN 0965-8564, <https://doi.org/10.1016/j.tra.2015.09.004>.

About 20% of EV owners use a smart charger that is Wi-Fi connected so it can use signals from the TDU, an aggregator, REP or NOE to start or stop charging based on price or demand. These residential smart chargers cost about \$1,750. Today some consumers use smart chargers to receive value by storing rooftop generated solar in their vehicles and thus recoup their excess costs.

Commercial charging equipment is far more expensive. A “smart” charger with 2 plugs and a credit card reader costs between \$5,500 and \$7,500. These can be interconnected and used to reduce demand if protocols exist and charging companies or hosts are rewarded.

Q3. How should utilities' existing programs, such as those designed pursuant to 16 TAC §25.181, be modified to provide additional reliability benefits? Texas needs a study to determine the full achievable potential of cost effective energy efficiency, load management, distributed generation, energy storage and EVs to meet the needs of the current and future grid. Until such time, we suggest that the Commission establish an interim goal of having 10% of projected demand for energy be met through energy efficiency, distributed generation, or demand response. Similar studies have been done throughout the history of the Commission but not since 2008, and since then outside studies typically found that Texas is near the bottom of spending on or utilization of these resources.

16 TAC §25.181 can easily be modified to include EVs and their batteries in the load control programs, time of use pricing or market transformation programs in. We would be glad to work with the Commission on specific language.

Q3a. What current impediments or obstacles prevent these programs from reaching their full potential? Fundamentally, what is missing is direction from the Commission to include EVs in these programs. Once that is established, the program and the rules that authorize a value stream that rewards EV owners for the added capital costs, interruption of service and the TDUs or others for operating the demand reductions program need to be developed.^{5,6}

⁵ ERCOT has a minimum of 1 MW resource to be qualified and bid into its markets (where resources can include generation, demand response and batteries). There are no provisions in ERCOT Protocols allowing for the aggregation of storage at different locations. For example, two 0.5 MW batteries at separate locations can't be aggregated to provide their total 1 MW into the ERCOT market. A smaller minimum (say 100kW) of aggregated, smaller (less than 1 MW) distributed resources, should be allowed by ERCOT to enhance distributed energy and V2G participation opportunities.

⁶ Energy consumed by an EV has to pay retail rates offered by a REP in the ERCOT competitive regions. REPs may or may not offer to compensate for V2G energy and are unable to receive/pass-along Ancillary

Q4. Outside of the programs contemplated in Question 3, what business models currently exist that provide residential demand response? There are at least nine offerings to manage EV demand.⁷

Q4a. What impediments or obstacles in the current market design or rules prevent these types of business models from increasing demand response and reliability? There are a number of simple modifications to 16 TAC §25.181 that would help:

- The time of use pricing program in §25.181 (g)(5)(C) needs to be modified to offer time of use pricing for EVs.
- The costs of more sophisticated interconnected Wi-Fi control charging equipment could be funded by a market transformation program in §25.181 (i).
- Wi-Fi enabled EVs should be allowed to participate in demand management programs.
- If accurately registered by location and node and enabled with a Wi-Fi connected charger, EVs could offer ERS services.

Q5. What changes should be made to non-residential load-side products, programs, or what programs should be developed to support reliability in the future? Bloomberg estimated in 2018 that Texans could see 34,500 electrified buses and 8,040 truck on the road in Texas by 2030. Managing the stored energy in these vehicles can offer a rich opportunity for demand response and distributed energy.

Electric school buses offer a particular opportunity to serve peak demand due to their unique operating characteristics and an examination of these characteristics can be illustrative in assessing how other types of fleets might offer benefits to the grid. Notably during the hot summer

Service payments for EVs in V2G mode. A protocol revision allowing EVs to participate in the ERCOT markets (e.g., a large fleet like in a School EV Bus yard). The energy consumed by the EVs while on the road is clearly energy subject to retail tariffs, but the energy offered back to the ERCOT market could be easily separated using bi-directional meters. In order to incentivize a robust V2G program, wholesale energy and Ancillary Service payments should be allowed under ERCOT protocols for EVs providing these services.

⁷ There are several Texas companies with special EV-related offerings including: MP2 Energy and Reliant (free nights and weekends), El Paso Electric (separate meter for TOU rates), Austin Energy (\$1,200 rebate for Wi-Fi enabled charging stations and special rates for smart public chargers), CPS Energy (special rates for allowing charging to be adjusted at peak, off peak rates, bill credits), Southwestern Electric Power (\$250 rebate for Level 2 EV home charger and reduced EV charging rates), and Oncor (\$3,000 rebate for the purchase of a Nissan Leaf). Tesla (filed an application to operate a REP called Autobidder which allows EV and Powerwall owners to aggregate and resell the energy stored in their batteries into the grid), Ev.energy (offers end-to-end solution for utilities, grid operators and retailers to directly control residential EV load that connect to both vehicles and EVSEs).

months, they are generally idle and thus their batteries' energy is available to feed into the grid with appropriate V2G technology. In addition, on the ~180 days year that they *are* in operation, their use follows a fixed on-road schedule of a few hours in the morning and a few in the later afternoon. This allows them to charge overnight when demand is low, top off their charge in the late morning, and provide backup energy at the end of the afternoon route when load on the grid peaks. Given their predictable schedule, e-school bus battery storage can be a reliable source of power to the grid.

Texas has the second largest fleet of school buses in the nation and at scale, this has a large potential to serve the grid during high demand. Based on a recent estimate,⁸ with 47,576 school buses in operation and using average monthly TX household energy consumption,⁹ a full state fleet could power 2,203,520 Texas households for a three hour energy event.

The storage capacity of electric school buses is a valuable asset, which is being recognized by business models in which a partner can assist in defraying the upfront capital cost differential of the vehicle and charging infrastructure in exchange for value in the battery storage. Even without that approach, Everman ISD, the first school district in Texas to operate with e-school buses determined that the move to e-school buses was financially as well as operationally sound,¹⁰ with a TCEQ grant and considering the significantly reduced fuel and maintenance costs.

Electric school buses can also serve as backup power during power outages, with appropriate vehicle-to-building (V2B) technologies, filling an important emergency response role.

Conclusion

The EV Market is emerging rapidly and EVs offer a significant tool for grid resilience, but rules need be modified and refined to allow EVs and associated stored energy to be deployed.

⁸ Personal communications with Marc Riccio noting also that it does not account for peak energy usage, Highland Electric Transportation, September 9, 2021.

⁹ Energy Information Administration, 2019 Average Monthly Bill - Residential, https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf.

¹⁰ J. Gillis, Everman ISD, Presentation to TxETRA E-School Bus Webinar "Electric Buses – Why Now is the Perfect Time," October 10, 2019. <https://blobby.wsimg.com/go/72575e9e-2507-4da5-8cef-62965bce93b4/JGillis%20-%20Everman%20ISD%20Bus%20Proposal.pdf>.